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09/854,304

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Robert J. Bernardi

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EXAMINER

BRINEY III, WALTER F

ART UNIT

PAPER NUMBER

2615

DATE MAILED: 06/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/854,304

Applicant(s)

BERNARDI ET AL.

Examiner

Walter F. Briney III

Art Unit

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15, 19-25 and 27-33 is/are rejected.
- 7) ☒ Claim(s) 16-18 and 26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 1-3, 6, 10, 13-15, 19, 22, 24, 28 and 33 are rejected under 35 U.S.C. 102(B) as being anticipated by Ruegg (US Patent 3,875,349).**

**Claim 1** is limited to “a system for sensing and compensating for at least one error signal.” Ruegg discloses a hearing aid as outlined in the Abstract. In essence, two microphones with varying directional characteristics are provided in a hearing aid that is enabled to automatically select between the microphones in response to the level of the input signal received by the currently selected microphone. See figure 2 and column 1, line 53, through column 2, line 3, and column 2, lines 8-17.

With respect to the claim language, the hearing aid of Ruegg comprises two microphones 11 and 12, which correspond to the “first” and “second microphones” of the “acoustic pick-up device.” By definition, each microphone receives an acoustic signal from an acoustic source and transduces the acoustic signals into audio signals.

Ruegg discloses a threshold value amplifier that outputs both an amplified input signal 20 as well as a signal indicating that the input signal 18 has exceeded a predetermined signal peak. See column 3, lines 18-24. As seen in figure 2, the amplifier receives inputs 13 and 14 from both microphones by way of reversing switch

23. In response to receiving an input from either microphone, output 24 is generated in accordance with the signal level on line 18. See column 3, lines 24-38. Output 24 corresponds to "the error signal" as recited. In particular, when microphone 12 is operational, a low input will be present on line 18 if the desired acoustic source is displaced from the "line-of-sight" of the hearing aid user. See column 1, lines 21-32. This represents "an angular mispositioning." Likewise, when microphone 11 is operational, a low input will be present during regular conversation when the source is located too far away to be distinguished from the background. This represents "a distance mispositioning." See column 1, lines 33-45. In both cases, proper noise cancellation cannot be achieved, as the desired signal is too quiet to distinguish from the background.

The above noted reversing switch 23 corresponds to the "controller." In particular, the switch uses the error signal 24 to "provide the audio signals 13/14 from at least one of the first microphone 11 and the second microphone 12 to the output 20." Therefore, Ruegg anticipates all limitations of the claim.

**Claim 2** is limited in part to "the system according to claim 1," as covered by Ruegg. Ruegg discloses a switch element 25 that corresponds to the "indicator." It generates an "indication" 26 that the "acoustic pick-up device" is mispositioned. Therefore, Ruegg anticipates all limitations of the claim.

**Claim 3** is limited in part to "the system according to claim 1," as covered by Ruegg. The error signal 24 determined by the amplifier 19 is inherently "determined

after audio signals are received.” See column 3, lines 18-24. Therefore, Ruegg anticipates all limitations of the claim.

**Claim 6** is limited in part to “the system according to claim 1,” as covered by Ruegg. The controller 23 is a reversing “switch” that transfers the signals from one of microphones 11 and 12 to the output. Therefore, Ruegg anticipates all limitations of the claim.

**Claim 10** is limited in part to “the system according to claim 1,” as covered by Ruegg. Ruegg discloses that the amplifier 19 comprises a threshold amplifier, which acts as a “sensor capable of determining the acoustic pick-up device being mispositioned,” i.e. when the output of microphone 12 is less than a threshold. See column 3, lines 18-24. Therefore, Ruegg anticipates all limitations of the claim.

**Claim 13** is limited in part to “the system according to claim 1,” as covered by Ruegg. The claim limitation “wherein the first microphone is disposed closer to the desired acoustic source than the second microphone” is not positively limiting on the structure or operation of the system itself when one realizes that neither the mobility of the system nor the mobility of the source is limited. The specification indicates that the invention is intended for use in a headset, which is certainly mobile. This mobility allows the headset to be readily repositioned relative to any acoustic source. However, by simply repositioning the headset, the structure and operation of the system remains unchanged. As the system disclosed by Ruegg is intended for use in a hearing aid, which is likewise mobile, it follows that the hearing aid of Ruegg can be repositioned

without changing its operation or effect. Therefore, Ruegg anticipates all limitations of the claim.

**Claim 14** is limited in part to "the system according to claim 1," as covered by Ruegg. It was shown apropos the rejection of claim 1 that Ruegg discloses a threshold amplifier 19 that determines whether an acoustic pick-up device comprising microphones 11 and 12 is mispositioned. Furthermore, Ruegg discloses detecting when "a desired acoustic source is operational" by performing frequency analysis with switch element 25, which corresponds to "a device determining whether the desired acoustic source is operational." See column 3, lines 28-35. Therefore, Ruegg anticipates all limitations of the claim.

**Claim 15** is limited in part to "the system according to claim 14," as covered by Ruegg. At any time, one of microphones 11 and 12 is coupled to the output 20. Such that, "when the acoustic source is operational" as indicated by switch element 25, microphone 12 will be connected to the output and "when the sensor determines that the acoustic pick-up device is mispositioned according to a predetermined threshold that is exceeded" as indicated by threshold amplifier 19 microphone 11 will be connected to the output. Therefore, Ruegg anticipates all limitations of the claim.

**Claim 19** is limited to "a system for controlling a directional response of at least one of a first microphone and a second microphone." It is submitted that the system of claim 19 is anticipated by the system of claim 1 as both include a first microphone and second microphone as well as position estimation circuit/means and controller/control means. Therefore, Ruegg anticipates all limitations of the claim.

**Claim 22** is limited to “a method of controlling a directional response of at least one of a first and second microphones.” The first microphone, second microphone and position estimation circuit of claim 1 perform the “receiving steps” and “detecting step” recited, and hence the recited steps are rejected for the same reasons. The reversing switch 23 used to reject the controller of claim 1 performs the “using” and “providing” steps. In particular, Ruegg discloses selecting between an omnidirectional and a directional response based on the error signal and providing the resulting audio signals to the output 20. Therefore, Ruegg anticipates all limitations of the claim.

**Claim 24** is limited in part to “the method according to claim 22,” as covered by Ruegg. Ruegg discloses a switch element 25 that corresponds to the “indicator.” It generates an “indication” 26 that the “acoustic pick-up device” is mispositioned. Therefore, Ruegg anticipates all limitations of the claim.

**Claim 28** is limited to “a method of sensing and compensating for an error.” The first microphone, second microphone, position estimation circuit and controller of claim 1 perform the “receiving steps,” the “detecting step” and the “using step” recited, and hence the recited steps are rejected for the same reasons. Therefore, Ruegg anticipates all limitations of the claim.

**Claim 33** is limited in part to “the method according to claim 28,” as covered by Hagen in view of Ruegg. It was shown apropos the rejection of claim 1 that Ruegg discloses a threshold amplifier 19 that determines whether an acoustic pick-up device comprising microphones 11 and 12 is mispositioned. Furthermore, Ruegg discloses detecting when “a desired acoustic source is operational” by performing frequency

analysis with switch element 25, which corresponds to "a device determining whether the desired acoustic source is operational." See column 3, lines 28-35. Therefore, Ruegg anticipates all limitations of the claim.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Killion et al. (US Patent 5,524,056) in view of Ruegg.**

**Claim 1** is limited to "a system for sensing and compensating for at least one error signal." Killion discloses a hearing aid having plural microphones as described in the Abstract. As seen in figure 6, "an acoustic pick-up device" having "a first microphone" 65 and a "second microphone 70" are provided. They will inherently be located at a first and second distance from any source, and by definition will receive acoustic input signals and transduce them into audio signals.

As seen in figure 6, a third microphone 15 and a switch 55 are provided. The switch serves to select between a directional and an omnidirectional response respectively provided by the combination of microphones 65 and 70 and microphone 15. In this way, the hearing aid embodiment of figure 6 corresponds to the hearing aid embodiment of Ruegg's figure 1. However, figure 6 of Killion anticipates neither the

position estimation circuit nor the controller as recited. However, these deficiencies are overcome by an obvious modification.

As noted supra, figure 6 of Killion corresponds to figure 1 of Ruegg. Ruegg discloses replacing the manual switch 22 with an automatic switch 23. See column 2, lines 4-17. In this way, a hearing aid user no longer has to manually adjust the directional response of a hearing aid, but can simply rely on characteristics of a particular environment to effect a change.

It would have been obvious to one of ordinary skill in the art at the time of the invention to automate the manual switch of Killion in the fashion as taught by Ruegg for the purpose of simplifying the user interface of a hearing aid involving the selection of a desired directional response.

**Claim 7** is limited in part to “the system according to claim 1,” as covered by Killion in view of Ruegg. Apropos the rejection of claim 1, the controller of the claims corresponds to the switch 23 of Ruegg, which also happens to correspond to switch 55 of Killion. Switch 55 transfers “the combined signal generated from a difference between the audio signals received from the first microphone 65 and the audio signal received from the second microphone 70.” Therefore, Killion in view of Ruegg makes obvious all limitations of the claim.

**Claim 8** is limited in part to “the system according to claim 1,” as covered by Killion in view of Ruegg. Element 75 of figure 6 corresponds to the recited “device adapted to produce a combined signal based on the audio signals received from the first and the second microphones.” In combination with Ruegg, switch 55 is controlled

by an error signal 24 to transmit the combined signal 80 to an output. Therefore, Killion in view of Ruegg makes obvious all limitations of the claim.

**Claim 9** is limited in part to "the system according to claim 8," as covered by Killion in view of Ruegg. As seen in figure 6 of Killion, the device 75 comprises a "summing unit." Therefore, Killion in view of Ruegg makes obvious all limitations of the claim.

**3. Claims 1, 4, 5, 11, 12, 19-23, 25, 27 and 28-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hagen et al. (US Patent 6,389,142).**

**Claim 1** is limited to "a system for sensing and compensating for at least one error signal." Hagen discloses an in-the-ear hearing with directional microphone system as described in the Abstract. As seen in figure 4, "an acoustic pick-up device" having "a first microphone" MIC F and a "second microphone" MIC B are provided. They will inherently be located at a first and second distance from any source, and by definition will receive acoustic input signals and transduce them into audio signals.

As seen in figure 4, a switch 55 is provided. The switch serves to select between a directional and an omnidirectional response respectively provided by the combination of microphones F and B and microphone F alone. In this way, the hearing aid embodiment of figure 4 corresponds to the hearing aid embodiment of Ruegg's figure 1, in that it provides selection between an omnidirectional and a directional response. However, figure 4 of Hagen anticipates neither the position estimation circuit nor the controller as recited. However, these deficiencies are overcome by an obvious modification.

As noted supra, figure 4 of Hagen corresponds to figure 1 of Ruegg. Ruegg discloses replacing the manual switch 22 with an automatic switch 23. See column 2, lines 4-17. In this way, a hearing aid user no longer has to manually adjust the directional response of a hearing aid, but can simply rely on characteristics of a particular environment to effect a change.

It would have been obvious to one of ordinary skill in the art at the time of the invention to automate the manual switch of Hagen in the fashion as taught by Ruegg for the purpose of simplifying the user interface of a hearing aid involving the selection of a desired directional response.

**Claim 4** is limited in part to “the system according to claim 1,” as covered by Hagen in view of Ruegg. Column 5, lines 29-45, indicates that the hearing aid uses two non-directional microphone systems 38 and 40, which respectively comprise MIC F and MIC B, making them omnidirectional microphones. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 5** is limited in part to “the system according to claim 4,” as covered by Hagen in view of Ruegg. “A noise cancelling microphone signal adapted from a difference between the audio signals received from the first microphone and the audio signals received from the second microphone” is generated by combining the signals on leads 42 and 44 at node 46, and is presented to amplifier 66 by lead 48. See column 5, lines 46-55. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 11** is limited in part to "the system according to claim 1," as covered by Hagen in view of Ruegg. Apropos the rejection of claim 1, the controller of Ruegg was incorporated into the system of Hagen, effectively replacing switch S1 with reversing switch 23. It is further noted that a "programmable phase delay" 54 is present in the system of Hagen that shifts signals from the "second microphone" MIC B as well as summing node 46, which acts as "a device producing a combined signal based on those signals being phase shifted and on the audio signals received from the first microphone, the device being further capable of transferring the combined signal to the output." Therefore, Hagen in view of Ruegg anticipates all limitations of the claim.

**Claim 12** is limited in part to "the system according to claim 11," as covered by Hagen in view of Ruegg. In effect, node 46 combines the signals of MIC F and MIC B, and hence, serves as "a summing unit." See column 5, lines 46-55. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 19** is limited to "a system for controlling a directional response of at least one of a first microphone and a second microphone." It is submitted that the system of claim 19 is unpatentable in view of claim 1 as both include a first microphone and second microphone as well as position estimation circuit/means and controller/control means. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 20** is limited in part to "the system according to claim 19," as covered by Hagen in view of Ruegg. When the controller 23 of Ruegg that was incorporated into the system of Hagen selects either a directional or omnidirectional response, the polar

pattern of the received audio signals changes. See column 5, lines 46-55. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 21** is limited in part to "the system according to claim 20," as covered by Hagen in view of Ruegg. The combination of the audio signals from microphones B and F inherently includes noise cancelling as a result of the combination. See column 5, lines 46-55. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 22** is limited to "a method of controlling a directional response of at least one of a first and second microphones." The first microphone, second microphone and position estimation circuit of claim 1 perform the "receiving steps" and "detecting step" recited, and hence the recited steps are rejected for the same reasons. The reversing switch 23 used to reject the controller of claim 1 performs the "using" and "providing" steps. In particular, Ruegg teaches selecting between an omnidirectional and a directional response based on the error signal and providing the resulting audio signals to the output 20. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 23** is limited in part to "the method according to claim 22," as covered by Hagen in view of Ruegg. When the directional response of Hagen is selected, "the output is a result of noise cancelling generated by a difference between the audio signals associated with the first microphone MIC F and the audio signals associated with the second microphone MIC B." See column 5, lines 46-55. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 25** is limited in part to “the method according to claim 22,” as covered by Hagen in view of Ruegg. Column 5, lines 29-45, indicates that the hearing aid uses two non-directional microphone systems 38 and 40, which respectively comprise MIC F and MIC B, making them omnidirectional microphones. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 27** is limited in part to “the method according to claim 22,” as covered by Hagen in view of Ruegg. The directional patterns selected by Hagen include a directional microphone and “an omnidirectional pattern.” See column 5, lines 46-55. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 28** is limited to “a method of sensing and compensating for an error.” The first microphone, second microphone, position estimation circuit and controller of claim 1 perform the “receiving steps,” the “detecting step” and the “using step” recited, and hence the recited steps are rejected for the same reasons. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 29** is limited in part to “the method according to claim 28,” as covered by Hagen in view of Ruegg. Hagen generates a combined output signal at node 46 by combining the signals on leads 42 and 44. The combining results in noise cancellation. See column 5, lines 46-55. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 30** is limited in part to “the method according to claim 28,” as covered by Hagen in view of Ruegg. Combining the microphone signals responsive to the error signal generated by the controller 23 incorporated from Ruegg inherently “adjusts a

directional response of at least one of the first and second microphones.” Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 31** is limited in part to “the method according to claim 28,” as covered by Hagen in view of Ruegg. The directional patterns selected by Hagen include a directional microphone and “an omnidirectional pattern.” See column 5, lines 46-55. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

**Claim 32** is limited in part to “the method according to claim 28,” as covered by Hagen in view of Ruegg. The directional patterns selected by Hagen include a directional microphone and “an omnidirectional pattern.” See column 5, lines 46-55. Therefore, Hagen in view of Ruegg makes obvious all limitations of the claim.

#### ***Allowable Subject Matter***

The following is a statement of reasons for the indication of allowable subject matter:

4. **Claims 16-18 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

**Claim 16** is limited in part to “the system according to claim 14,” as covered by Ruegg. There is no suggestion in Ruegg or any other cited prior art to “determine progressive levels of the acoustic pick-up device being mispositioned.” At most, Ruegg discloses one threshold. See column 3, lines 18-24. Thus, claim 16 is allowable over the cited prior art.

**Claims 17 and 18** depend on claim 16, and thus, are allowable over the recited prior art for at least the same reasons.

**Claim 26** is limited in part to "the method according to claim 22," as covered by Ruegg. There is no suggestion in Ruegg or any other cited prior art to "determine progressive levels of the acoustic pick-up device being mispositioned." At most, Ruegg discloses one threshold. See column 3, lines 18-24. Thus, claim 16 is allowable over the cited prior art.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-33 have been considered but are moot in view of the new ground(s) of rejection.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F. Briney III whose telephone number is 571-272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

WFB



**SINH TRAN**  
**SUPERVISORY PATENT EXAMINER**